PROCEEDINGS

OF

# THE ROYAL SOCIETY.

1834–1835. No. 21.

June 4, 1835.

The Rev. GEORGE PEACOCK, M.A., Vice-President, in the Chair.

Edward Blackett Beaumont, Esq.; William Borrer, Esq.; John Davidson, Esq.; Sir Richard Dobson, Knt.; Thomas Jones, Esq.; Thomas Mayo, M.D.; Benjamin Oliveira, Esq.; and Captain William Symonds, R.N., were elected Fellows of the Society.

M. Elie de Beaumont; M. Frederick Cuvier; M. Flourens; Professor Hanson; and Dr. Rosenberger, were elected Foreign Members of the Society.

The reading of a paper, entitled, "On the Influence of the Tricuspid Valve of the Heart on the Circulation of the Blood." By T. W. King, Esq., M.R.C.S. Communicated by Thomas Bell, Esq., F.R.S., —was resumed and concluded.

The purport of this paper is to prove experimentally that the tricuspid valve of the human heart does not, in the ordinary state of the circulation, completely prevent the reflux of blood from the ventricle into the auricle on the right side, and that the amount of regurgitation is continually varying according to the different degrees of distention of the ventricle. The author points out the anatomical differences between the auriculo-ventricular valves on the right and left sides of the heart; from the consideration of which it might have been inferred, independently of direct experiment, that while the structure of the mitral valve is adapted to close accurately all communication between the left auricle and ventricle during the contraction of the latter, that of the tricuspid valve is designedly calculated to allow, when closed, of the flow of a certain quantity of blood from the right ventricle back again into the auricle. The comparatively imperfect valvular function of these latter membranes is shown by various experiments on recent hearts, in which it was found that fluids injected, through the aorta, into the left ventricle, were perfectly retained in that cavity, by the closing of the mitral valve; but that when the right ventricle was similarly injected through the pulmonary artery, the tricuspid valves generally allowed of the escape of the fluid in streams, more or less copious, in consequence of the incomplete apposition of their margins. On repeating these experiments on different animals the author obtained similar results; but found that the imperfection of the valvu-

lar function was greater, the sooner the heart was examined after the death of the animal; and that if the trials were made after the lapse of a certain time, the rigidity which gradually supervened on the muscular fibres of the heart, and of the *carneæ columnæ* attached to the margins of the valves, brought them into more complete apposition and led to the accurate closing of the passage. This effect, however, was never so perfectly accomplished in the tricuspid, as in the mitral valves.

The author regards this peculiarity of structure in the tricuspid valve as an express provision against the mischiefs that might result from an excessive afflux of blood to the lungs, analogous to a safety-valve; and as more especially advantageous in incipient diseased enlargements of the right ventricle. He adverts to the conditions of the heart during the fœtal state of existence, in which the same necessity of guarding against excessive pressure does not occur, and where the structures are found to correspond to the variation of functions. A similar adjustment of the right auriculo-ventricular valve to the peculiar circumstances and habits of animals may also be traced by extending the inquiry to various classes of animals.

"Report of a Committee for collecting Information respecting the occurrence of, and the more remarkable Phænomena connected with, the Earthquakes lately felt in the Neighbourhood of Chichester." By J. P. Gruggen, Esq. Communicated in a letter to P. M. Roget, M.D., Sec. R.S.

This paper contains an authentic report of the shocks of earthquakes which, during the last two years, have been felt at Chichester and the surrounding country; drawn up from accounts given by various correspondents, in answer to printed queries extensively circulated. The first shock occurred on the 18th of September, and the second on the 13th of November, 1833. Another and more severe shock was felt on the 23d of January, 1834, and in the latter end of the same year two slighter shocks were experienced, namely, one on the 27th of August, and the next on the 21st of September; the last, which was less than any of the former, took place on the 12th of January, 1835.

The Society then adjourned over Whitsun week to meet again on the 18th instant.

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June 18, 1835.

Sir JOHN RENNIE, Knt., Vice-President, in the Chair.

June 18.—The following papers were read:

"Discussion of Tide-Observations made at Liverpool." By J. W. Lubbock, Esq., V.P. and Treas. R.S.

The author has here presented to the Society, by permission of the *British Association for the Advancement of Science*, a discussion by M. Dessiou of about 14,000 tide-observations made at Liverpool, on the plan similar to that adopted with regard to the London Dock observations. The first book contains the moon's transits, classified